CDF Data Handling

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CDF Week

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CDF Data Handling

- Organize, access, archive the data.
- Components of DH (status later): Computing system, data disks, tape archive, Datafile Catalog, AC++ IO Modules, Disk Inventory Manager & Stager, LSF batch queues, datalogger.
- Ref: cdf5310, Chep2000 papers 366-368.

Organization of Data - 1

- Datasets, in hierarchy (mostly)

  - Dataset = “collection” of events of particular “content”
  - “Collection” defined by Level 3 bits for raw and pad, by group/user AC++ filter for secondary datasets, by MC job, etc.
  - “Content” is raw, pad, other.
  - Raw data forms “streams” = combined primary datasets Stream accessed as “raw dataset”.

Organization of Data - 2

Events → Runsections → Run

- Runsections defined about every 30 sec so contain 2000 events approx.
- Calculate integrated luminosity by runsection, then sum.
- Define data quality by runsection.
- Note that dynamic trigger prescale values change on runsection boundaries.

Organization of Data - 3

- For accessing data, hierarchy is:

Dataset → Fileset → File → Runsection → Events

- All events of a given runsection in same file (not in order) (1 GB).
- Fileset is group of files forming a tape “partition” (10 GB).
- Unit of data for disk management is fileset.

Datafile Catalog

- Use a database to keep “meta-data” - Oracle at Fermi.
- Main Tables:

Dataset	Runsection
Fileset	Tape
File	Tape_pool

- Other associated records contain:
- for files, list of runsections (for lum sums and qual tests).
- for runsections, dynamic trigger prescale values.
- Browser under development, see next slide.

Datafile Catalog

- 4 slides showing web browser pages for datasets, filesets, files, runsection ranges, and runsections.

Access to Data

- DHInput and DHOutput are AC++ IO modules in CVS package DHMods. Consider DHInput (later for DHOutput)

DHInput User Guide, from http://rutpc7.fnal.gov/ratnikov/Docs

An example may be found in the CDFSOFT2, directory DHMods/bin/DHInput.
A validation executable including DHInput and EventDump is made there.

The example Tcl file used for validation job looks like:

```
talk DHInput
   include dataset "MDC-1_PAD_TOP_HIGGS_SUSY"
   show include
exit
```

- Can also specify files or directories instead.

User View of Data Access

- 2 transparencies: from Chep2000 paper 368, and bubbles diagram.

Disk Inventory Manager

- Prototype running since September 1999
- Desired client-server version under construction now, basic version ready for MDC2A, 2B, and Commissioning Run.
- Expand functionality (e.g. quotas, priorities, etc.) during next few months.

LSF Batch Queues

- LSF package from Platform Computing adopted for batch system.
- Basic commands: bsub, bpeek, bkill

  bhist, bjobs, bqueues

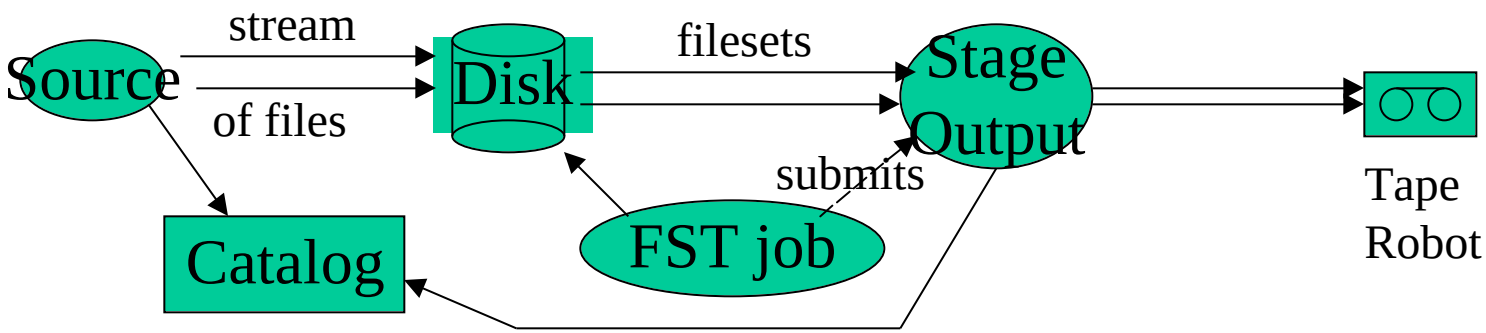
  xlsbatch
- Quotas and priorities not set up yet.
- Only basic queues: short, medium, long, very_long.

fcdfsgi2

- First big box of multi-flavor unix cluster.
- 64 processors, 4 times cdfsga, 1/3 of current goal.
- 7 TB disk here, 4TB configured for use; goal is 30 TB.
- 4 TB divided into: 2TB managed by DIM, 2TB by groups.

Archive Data

- Basic technique for adding to a dataset:



- Source (e.g. DHOutput) makes file size about 1 GB, and keeps runsections in files.
- Fileset-tape(FST) daemon forms files into filesets, and filesets into tapes.

Sources of Data

- Online: B0 CS datalogger writes a stream of files to a dual ported disk, then FST daemon takes data.
- Online: A similar low bandwidth path gets online test files to fcdfsgi2 for user access. Not archived, so no FST job.
- Farm puts out a processed stream split into the primary datasets. One FST daemon deals with all datasets.
- Group/user/MC: Proposals will exist soon for methods to create custom datasets, including MC from remote sites.

Status of Components (Short term)

• Computing	• Ready
• Disks	• Ready
• Tape archive	• Tape drives on order
• DHInput	• Ready
• DHOutput	• Updated version soon
• Catalog	• Usable, some fixes on way
• DIM/Stager	• Basic version soon
• LSF batch	• Basic setup ready
• FCC datalogger	• Updated version soon

Status of Components (Longer term)

- Computing
- Disks
- Tape archive
- DHInput
- DHOutput
- Catalog
- DIM/Stager
- LSF batch
- FCC datalogger

- Next upgrade
- Add disks
- Add drives; finalize software
- Restart, data quality, etc
- Use DIM, user catalogs
- So much work, needs a group
- Full functionality
- Replace Liz Buckley-Geer
- Needs a person

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